Amendments to the Specification:

Please amend the Summary of the Invention in the application as filed by deleting in their entirety the paragraph that starts at line 28 on page 7 and ends at line 10 on page 8; and the paragraph that starts at line 19 on page 9 and ends at line 14 on page 10.

Please amend the Summary of the Invention as amended by the Non-Fee Amendment Under Rule 111 filed on November 25, 2003 by adding at the end thereof new paragraphs as follows:

The invention is also embodied as a method for controlling a process that comprises:

a) receiving plant measurement variables from a regulatory control system;

b) pretreating said plant measurement variables;

c) reconciling said pretreated plant measurement variables;

d) using said reconciled and pretreated plant measurement variables to update one or more variables of each submodel of a nonlinear model, said nonlinear model having two or more of said submodels, each of said two or more submodels having a predetermined one of two or more model predictive controllers associated therewith;

e) converting at least one updated submodel of said updated nonlinear model to a linear submodel when a change in said one or more of said updated submodel variables has exceeded a predetermined threshold, said linear submodel for operating said associated one of said two or more controllers;

f) using said nonlinear model in a real time optimizer to compute targets for all of said two or more model predictive controllers, a predetermined subset of said computed targets associated with a respective one of said two or more controllers;

g) passing each of said predetermined subsets of said computed targets associated with a respective one of said two or

more model predictive controllers to said associated one of said two or more controllers;

h) converting said at least one linearized submodel to a full order state space submodel;

i) creating from said full order state space submodel a state space submodel having fewer states than said full order state space submodel;

j) converting said fewer states state space submodel to a MPC format submodel; and

k) evaluating the performance of said MPC format submodel with the tuning for a presently existing submodel of said process in said associated one of said two or more model predictive controllers versus the performance of said presently existing submodel with said tuning and either:

passing said MPC format submodel with said presently existing submodel tuning to said associated one of said two or more model predictive controllers when said performance evaluation of said MPC format submodel exceeds a first predetermined limit; or

computing new tuning for said MPC format submodel when said performance evaluation of said MPC format submodel falls below said first predetermined limit and repeating said evaluations; or

returning said MPC format submodel to said creating a MPC format submodel having fewer states than said full order state space submodel to change the number of states in said MPC format submodel when said performance of said MPC format submodel falls below said first predetermined limit.

The invention is also further embodied as a method for controlling a process that comprises:

a) receiving plant measurement variables from a regulatory control system;

b) pretreating said plant measurement variables;

c) reconciling said pretreated plant measurement variables;

d) using said reconciled and pretreated plant measurement variables to update one or more variables of each submodel of a nonlinear model, said nonlinear model having two or more of said submodels, each of said two or more submodels having a predetermined one of two or more model predictive controllers associated therewith;

e) converting at least one updated submodel of said updated nonlinear model to a linear submodel when a change in one or more model prediction errors in an associated one of one or more MPC format submodels currently operational in an associated one of said two or more model predictive controllers has exceeded a predetermined threshold, said linear submodel for operating said associated one of said two or more controllers;

f) using said nonlinear model in a real time optimizer to compute targets for all of said two or more model predictive controllers, a predetermined subset of said computed targets associated with a respective one of said two or more controllers;

g) passing each of said predetermined subsets of said computed targets associated with a respective one of said two or more model predictive controllers to said associated one of said two or more controllers; and

h) converting said at least one linearized submodel to a full order state space submodel;

i) creating from said full order state space submodel a state space submodel having fewer states than said full order state space submodel;

j) converting said fewer states state space submodel to said MPC format submodel; and

k) evaluating the performance of said MPC format submodel with the tuning for a presently existing submodel of said process in said associated one of said two or more model predictive controllers versus the performance of said presently existing submodel with said tuning and either:

passing said MPC format submodel with said presently

existing submodel tuning to said associated one of said two or more model predictive controllers when said performance evaluation of said MPC format submodel exceeds a first predetermined limit; or

computing new tuning for said MPC format submodel when said performance evaluation of said MPC format submodel falls below said first predetermined limit and repeating said evaluations; or

returning said MPC format submodel to said creating a MPC format submodel having fewer states than said full order state space submodel to change the number of states in said MPC format submodel when said performance of said MPC format submodel falls below said first predetermined limit.

The invention is also embodied further as a method for controlling a process that comprises:

a) receiving plant measurement variables from a regulatory control system;

b) pretreating said plant measurement variables;

c) reconciling said pretreated plant measurement variables;

d) using said reconciled and pretreated plant measurement variables to update one or more variables of each submodel of a nonlinear model, said nonlinear model having two or more of said submodels, each of said two or more submodels having a predetermined one of two or more model predictive controllers associated therewith;

e) converting at least one updated submodel of said updated nonlinear model to a linear submodel when a change in said one or more of said updated submodel variables has exceeded a predetermined threshold, said linear submodel for operating said associated one of said two or more controllers;

f) using said nonlinear model in a real time optimizer to compute targets for all of said two or more model predictive controllers, a predetermined subset of said computed targets associated with a respective one of said two or more

controllers;

g) passing each of said predetermined subsets of said computed targets associated with a respective one of said two or more model predictive controllers to said associated one of said two or more controllers; and

h) passing said linear model to said associated one of said two or more controllers comprising:

evaluating the performance of said MPC format submodel with the tuning for a presently existing submodel of said process in said associated one of said two or more model predictive controllers versus the performance of said presently existing submodel with said tuning and either:

passing said MPC format submodel with said presently existing submodel tuning to said associated one of said two or more model predictive controllers when said performance evaluation of said MPC format submodel exceeds a first predetermined limit; or

computing new tuning for said MPC format submodel when said performance evaluation of said MPC format submodel falls below said first predetermined limit and repeating said evaluating.

The invention is further embodied as a method for controlling a process that comprises:

a) receiving plant measurement variables from a regulatory control system;

b) pretreating said plant measurement variables;

c) reconciling said pretreated plant measurement variables;

d) using said reconciled and pretreated plant measurement variables to update one or more variables of each submodel of a nonlinear model, said nonlinear model having two or more of said submodels, each of said two or more submodels having a predetermined one of two or more model predictive controllers associated therewith;

e) converting at least one updated submodel of said updated nonlinear model to a linear submodel when a change in

one or more model prediction errors in an associated one of one or more MPC format submodels currently operational in an associated one of said two or more model predictive controllers has exceeded a predetermined threshold, said linear submodel for operating said associated one of said two or more controllers;

f) using said nonlinear model in a real time optimizer to compute targets for all of said two or more model predictive controllers, a predetermined subset of said computed targets associated with a respective one of said two or more controllers;

g) passing each of said predetermined subsets of said computed targets associated with a respective one of said two or more model predictive controllers to said associated one of said two or more controllers; and

h) passing said linear model to said associated one of said two or more controllers comprising:

evaluating the performance of said MPC format submodel with the tuning for a presently existing submodel of said process in said associated one of said two or more model predictive controllers versus the performance of said presently existing submodel with said tuning and either:

passing said MPC format submodel with said presently existing submodel tuning to said associated one of said two or more model predictive controllers when said performance evaluation of said MPC format submodel exceeds a first predetermined limit; or

computing new tuning for said MPC format submodel when said performance evaluation of said MPC format submodel falls below said first predetermined limit and repeating said evaluating.